

Secondary prevention of osteoporotic fractures: why not apply the evidence?

A recent study carried out in a major Swiss university hospital indicated that up to 70% of prevalent vertebral fractures on routine lateral chest x-rays remained undetected by both radiologists and internists [1]. Vertebral fractures, a hallmark of bone fragility, are often clinically silent and misinterpreted as simple “deformities”, leading to neglect of both the underlying diagnosis and treatment of osteoporosis. It has been shown that targeted education can improve these results [1], although there is doubt that educational effects on the awareness of osteoporosis can be sustained and expanded beyond their site and period of implementation. The report by Suhm et al. in this issue of SMW [2], on the management of osteoporosis following a clinical fragility fracture in Switzerland, is alarming indeed. This study was conducted in eight major Swiss hospitals, including university, cantonal and regional hospitals, which had a dual energy x-ray absorptiometry (DXA) machine on-site: over a period of 8 to 16 months nearly 5000 patients aged 50+ years were admitted with a fracture of any kind to one of these medical centres. After ruling out high velocity fractures, pathological fractures and other medical conditions (such as poor health, dementia, etc) precluding inclusion in the study, 3667 subjects undergoing orthopaedic management of a “fragility fracture” (i.e. a fracture following minimal trauma) were observed until discharge. Among them, an evaluation of bone mineral density (BMD) by DXA – currently the gold standard for the detection of low bone mass – was assessed or planned in less than a third, and osteoporosis drugs were prescribed at discharge in only 24% of women and 14% of men. Further, underdiagnosis and undertreatment of osteoporosis grew with each decade of patient age, confirming previous observations that elderly patients who most deserve osteoporosis care get the least [3]. Interestingly, in the latter study, the rates of DXA scans and osteoporosis medication were 33% and 23% respectively in post-menopausal women with a fragility fracture of the distal radius [3]. These results, virtually identical to those of Suhm et al., were based on observations from a US medical centre in the year 1997: ten years later, what have we learned?

In the present study, when BMD was evaluated in subjects with a fragility fracture, a T-score below -2.5 (the WHO threshold definition for osteoporosis) was found in only some 50% of the cases, which is a common finding [4]. This is due to the fact that bone fragility results from both a

decrease in bone mineral mass and deterioration of bone microarchitecture [5], such as cortical porosity and loss and thinning of trabeculae, which is not necessarily well correlated with BMD changes and therefore under-evaluated by DXA. Hence, in patients with a fragility fracture, osteoporosis should also be diagnosed when the BMD value lies within the osteopenic range (-1 to -2.5 T-score). In addition, a recent study indicated that low BMD and an increased incidence of second fractures were similar in 65+ women with high-trauma fractures (i.e. due to motor vehicle crashes and falls from greater than standing height) and those with low-trauma fragility fractures, suggesting that after a certain age all types of fracture should prompt us to consider the possibility of osteoporosis.

There are many reasons which might explain, but not excuse, the less than optimal medical care of osteoporotic fractures in Swiss hospitals. First is the fragmented delivery of care, in which the main role of orthopaedic surgeons is to “fix” the fracture; second, it is the role of internists/geriatricians to take care of the potential systemic complications, and eventually the role of doctors in rehabilitation facilities to improve the functions necessary for subjects’ daily activities. In this setup it is not always clear who bears prime responsibility for initiating osteoporosis treatment. I would argue that it is the responsibility of all doctors along the chain of care for fragility fractures to think “osteoporosis” and act accordingly. Care of osteoporosis does not stop at the main hospital’s door: so we may hope, though we should not rely on this, that the proportion of patients who will eventually receive an osteoporosis drug from the family physician will improve upon follow-up. The second main reason for inadequate osteoporosis care in our country and elsewhere is the persistent failure to recognise the importance of the problem. Lippuner et al. reported that the cumulative number of days spent by women and men in Swiss hospitals over one year in relation to osteoporosis (i.e. about 380’000 hospitalisation days) equalled the number of hospital days due to chronic obstructive pulmonary disease and heart failure put together [6]. Following a fragility fracture, the risk of a new fracture increases more than twofold [7]. In the Framingham Study, 71 out of 481 (14.8%) men and women with a hip fracture had a subsequent hip fracture at a mean follow-up of 4.2 yrs [8]. Third, and perhaps most importantly, failure to prescribe an osteoporosis drug may arise from physicians

ignoring the evidence for treatment efficacy [9] and/or fear of related complications and costs. Two recent Cochrane reviews on alendronate and risedronate indicate that for secondary prevention the relative risk reduction (RRR) for vertebral fractures is 39% to 45%, for hip fractures 26% to 53%, and for non-vertebral fractures altogether 20% to 23% [10, 11]. Alendronate also reduced the risk of secondary wrist fractures by 50%. The absolute risk reduction achieved by these oral agents typically lies within the 1% to 5% range, depending on the fracture type. A unique double-blind, placebo controlled, prospective trial of IV zoledronate (5 mg/yr) in patients with a recent hip fracture showed a 35% RRR for new clinical fractures (absolute RR -5.3%) and a 28% reduction in mortality, an impressive result of unexplained cause [12]. Moreover, this trial found, consistent with preclinical findings, no evidence that early administration of a potent IV bisphosphonate would impair fracture healing.

In summary, it is mandatory to prescribe an osteoporosis drug regardless of DXA in all postmenopausal women and 50+ men with a vertebral or hip fragility fracture (as advocated by the 2008 guidelines of the US National Osteoporosis Foundation). DXA should be performed to diagnose low bone mass in all 50+ patients with a fragility fracture other than of vertebrae or hip, probably also in those over 65 years of age with a

high-trauma fracture, and more broadly for monitoring drug effects over time. In addition, when the diagnosis of osteoporosis is not obvious already, guidance for the prescription of osteoporosis medication can be obtained using a calculation tool (FRAX[®], www.shef.ac.uk/FRAX/) that incorporates additional clinical risk factors, such as a positive family history of hip fracture, alcohol intake, smoking, corticosteroid use, rheumatoid arthritis etc, in addition to previous fractures, weight, height and/or hip T-score, to evaluate future fracture probability [13].

The study of Suhm et al. is there to remind us that evidence-based medicine for the management of osteoporosis beyond surgical repair of fragility fractures is available, and should be applied.

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